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more or less inaccessible and most of it closet made. So far as the reviewer can see, *O. woodwardi* is a valid species. It is well figured by Mr. Waite.

In the *Revista do Museu Paulista*, Dr. Carl H. Eigenmann and Allen A. Norris record (in Portuguese) species of fishes collected by Dr. H. von Ihering about Santos, in the Province of São Paulo. The following are described as new: *Nannoglanis bifasciatus*, *Imparfinis piperatus*, *Galdiella (eques)* (new genus), *Iheringichthys (labrosus)*, *Bergiella (westermanni)*, *Perugia (agassizii)*, *Párodon tortuosus*, *Tetragonopterus multifasciatus*, *Catabasis acuminatus*, *Myletes ticté*. Of the new genera, *Imparfinis* is an ally of *Rhamdiella*, and *Catabasis* of *Salminus*. The others are based on known species.

Dr. Carl H. Eigenmann sums up his researches on the degeneration of Amblyopsidæ and the reaction of blind-fishes to light in a lecture before the Marine Biological Laboratory at Woods Holl, published by Ginn & Company (1900). He regards the bleaching due to absence of light as an acquired character which is now fully inherited. "It is evident that in Amblyopsis we have the direct effect of the environment on the individual hereditarily established."

In the *Anatomischer Anzeiger* (XVII, p. 313), Professor George H. Parker has a valuable study of the blood vessels of the heart of the headfish or sunfish (*Mola mola*). He finds that, unlike most bony fishes, this species has retained in part the complex structures found in the Elasmobranchs, without the simplification or degradation seen in the ordinary bony fishes. When anatomists realize that not all bony fishes agree even in important characters, they will not so generally confine their studies in fish anatomy to the primitive end of the fish series. There is no more open field in science than that of the structure and development of the different groups of Teleost fishes.

D. S. J.

**The "Tierreich" Sporozoa.**<sup>1</sup>—The work opens with a summary of abbreviations of technical terms and one for the literary references, together with a systematic index. The taxonomic survey of the various genera and species of the group, which occupies the major portion of the book and follows the general plan employed in the publication as a whole, is complete and better illustrated than some previous numbers. After this comes a list of hosts, which embraces

<sup>1</sup> Labbé, Alphonse. *Sporozoa. Das Tierreich*, 5. Lieferung. Berlin, Friedländer, 1899. xx + 180 pp., 196 figs.

more than six hundred species in every branch of the animal kingdom and which shows clearly by the number of entries—91 under Vermes, 121 under Hexapoda, 95 under Pisces, and 93 under Aves—what groups are particularly infested by these parasites. An alphabetic index of genera and species completes the work. The fact that, as entered on the last page, the manuscript was closed in December, 1897, while the title-page bears the imprinted date of July, 1899, goes far to explain certain shortcomings in the work, for our knowledge of this group has been particularly widened by some very recent contributions. An additional difficulty in the treatment of these forms is to be seen in the record of 94 known and 29 doubtful genera, embracing 239 certain and 259 doubtful species, as given by the author at the opening of the systematic part.

The system employed by Labbé is as follows:

- I. Legion Cytosporidia (spore wanting or without polar capsules).
    1. Order Gregarinida (sporulation not intracellular).
      - A. Suborder Cephalina.
        - a. Tribe Gymnosporea.
        - b. Tribe Angiosporea.
      - B. Suborder Acephalina.
    2. Order Coccidiida (sporulation intracellular; no motile free stage in adult form).
      - A. Suborder Polyplastina (many archisporos).
        - a. Tribe P. digenica.
        - b. Tribe P. monogenica.
      - B. Suborder Oligoplastina (few archisporos).
        - a. Tribe Tetrasporea.
        - b. Tribe Trisporea.
        - c. Tribe Dispora.
    3. Order Hæmosporidiida (sporulation intraglobular).
    4. Order Gymnosporidiida (adult amœboid; no cyst).
  - II. Legion Myxosporidia (spores with polar capsules).
    1. Order Phænocystida (polar capsules distinct).
    2. Order Microsporidiida (capsules invisible in life).
- Sporozoa *incertæ sedis*: Sarcosporidia,  
                                   Amœbosporidia,  
                                   Serumsporidia.

A number of genera, including Amœbidium, Piroplasma, and Babesia, are listed as Sporozoa *incertæ*, while Coccidioides and the pseudo-Coccidia are included in an appendix.

It is not to be expected that a group including so many poorly known forms and so many species, genera, and even possible orders,

whose relations are uncertain and concerning whose life history nothing has yet been ascertained, could be satisfactorily monographed at this time. Even the brief interval which has intervened since the completion of the book has furnished positive evidence that certain genera, *Eimeria* and *Pfeifferella*, are merely developmental stages in the evolution of other forms, a relation which, by the way, is noted as a possibility in the description of some species in the text. With this the entire tribe of *Polyplastina monogenica* probably disappears, as the species are incorporated into the life history of others in the *P. digenica*. Similarly, in the *Oligoplastina* the single species of *Trisporea* is but a chance variation of the usual four-spored condition of that form, and thus another tribe falls out.

The two orders of *Hæmosporida* and *Gymnosporida* are distinguished by the presence of a gregarine stage and of a cyst in the former, and by their absence in the latter. Recent discoveries on the life history of the malarial parasite have shown that this distinction will not hold, and apparently the two orders are much nearer together than most of the families given in the synopsis. In the classification of the *Myxosporidia*, Labbé has followed Thélohan very closely and has attained a less artificial system than that of Gurley. Under the *Sarcosporidia*, however, the result is less satisfactory, and in the present ignorance concerning these forms it is not clear that anything has been gained by the suppression of Blanchard's genera, *Miescheria* and *Balbiana*, a movement in which the author is not likely to be followed at present, at least.

A considerable number of changes in generic and specific names were necessary where the earlier names were preoccupied; it may be questioned, however, whether changes in spelling, *e.g.*, *Plistophora* for *Pleistophora* Gurley, do more than add to the already heavy burden of synonyms. Among familiar names which have been supplanted necessarily may be noted *Glugea*, antedated by *Nosema*, *Proteosoma* by *Hæmoproteus*, and *Drepanidium* preoccupied and replaced by *Lankesterella*. In glancing over the list of genera current among the *Sporozoa* one cannot help being struck by the dedicational-phobia which has afflicted students of the group!

Among the large number of uncertain genera and species listed, some are capable of being precisionized: thus, of the fifteen doubtful species of *Gregarinida* briefly described by Leidy, the unpublished drawings for his monograph on the group are still in existence and, it is to be hoped, may be published with satisfactory descriptions. Others of the *sp. inq.* are yet under discussion and will ultimately be

placed; but many of the references are mere rubbish and should be noted as such, to save the labor of future students. Thus, the uncertain genus, *Molybdia* Pachinger, has been shown by Braun to be in all probability based on eggs of *Distomum turgidum*, and yet no note of this fact appears in the text. If all references to supposed members of the group are to be included, reference should have been made to *Coccidium pylori* Gebhardt, a species founded on a similar confusion. The listing of such forms without explanation entails endless labor on those not familiar with the details of the particular case, and reference should be made under doubtful forms to all such explanations, whether accepted by the monographer or not.

Some instances were noted of opposite conclusions in cases involving very similar conditions. Thus, the author accepts two genera, *Hæmoproteus* and *Halteridium*, for the parasites of the avian red-blood corpuscles, but reduces similar forms of man, not only to one genus, but even to varieties of a single species! Some of the differences given to the first-named genera in the text, it should be noted, have never been confirmed since the original observations of Labbé on these forms. Again, he accepts the genus *Goussia* on the basis of a trivial difference in the form of the sporocyst, but rejects *Benedenia* as an independent genus, though it differs radically in number of sporozoites produced. Recently discovered differences in life history make the distinctness of this genus unassailable.

Withal, these are minor criticisms; Labbé has traversed nearly untrodden ground. It is not surprising that the results are most satisfactory on best-known territory, *e.g.*, Gregarinida, and weakest in those groups, such as the Coccidiida and *Hæmosporidiida*, which are not only least known, but which are now the object of careful study at many hands. The work of the author is very complete and is a mine of useful information for workers on this group; remarkably few references are lacking, and only a simple misprint was noted. The figures also are well selected and, for the most part, well reproduced.

HENRY B. WARD.

**Faune de France.**<sup>1</sup>—Half a century ago this work would have been accepted as very good; to-day it is out of date in classification, in method, and to some extent in illustration. The classification shows little improvement on that of Cuvier. The method is synoptic; in the special synopses the points of comparison are most often

<sup>1</sup> Aclouque, A. *Faune de France. Les Poissons, les Reptiles, les Batraciens, les Protochordes.* Paris, Baillière, 1900. Pp. 209, 12mo, illustrated.